# *United States Court of Appeals*
# *for the*
# *District of Columbia Circuit*

# TRANSCRIPT OF RECORD

946

# BRIEF FOR APPELLANT

---

## UNITED STATES COURT OF APPEALS
## FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 21098

United States Court of Appeals
for the District of Columbia Circuit

FILED MAR 25 1968

Nathan J. Paulson
CLERK

**ALEXANDER T. DEUTSCH,**

Appellant,

v.

**U. S. ATOMIC ENERGY COMMISSION**

Appellee.

Appeal From The Atomic Energy Commission,
Patent Compensation Board

United States Court of Appeals
for the District of Columbia Circuit

FILED MAR 25 1968

Nathan J. Paulson
CLERK

SOL B. WICZER
1000 Vermont Avenue, N. W.
Washington, D. C.

H. THOMAS SISK

M. MICHAEL CRAMER
1030 - 15th Street, N. W.
Washington, D. C. 20005
223-2555

Attorneys for Appellant

## STATEMENT OF QUESTION PRESENTED

In the opinion of appellant, the question presented is:

Did not the Patent Compensation Board of the Atomic Energy Commission err when it held that there was substantial evidence to the effect that appellant had not made an invention which was used by the Atomic Energy Commission and, if appellant did invent a meritorious food processing method, than, such invention did not come within the class which qualified the inventor for compensation?

# INDEX

Page

## SUBJECT INDEX

Statement of Question Presented . . . . . . . . . . . . . . i

Statement of the Case . . . . . . . . . . . . . . . . . 1

Statutes Involved . . . . . . . . . . . . . . . . . . . 9

Summary of Arguments . . . . . . . . . . . . . . . . . 10

Arguments

I. Appellant's Invention is Now Being Used By The Atomic Energy Commission Without Compensation Being Granted . . . . . . . 12

II. The Board's Basis For Denial Of An Award Was Without Substantial Evidence And Was Arbitrary and Capricious

A. Appellant's Invention Was Not Anticipated By Other Patents . . . . . . . . 14

B. The Atomic Energy Commission Is Using Appellant's Invention . . . . . . . . 15

C. The Mixing of the Isotopes With The Food . . . . . . . . . . . . . . . . . . 17

D. The Quantity of Irradiation . . . . . . . . 20

III. The Authority Of The Patent Compensation Board . . . . . . . . . . . . . . . . 22

Conclusion . . . . . . . . . . . . . . . . . . . . . . 26

Certificate of Service . . . . . . . . . . . . . . . . 27

## STATUTES CITED

Page

The Atomic Energy Act of 1946
Patents and Inventions, Section 11 (d) . . . . . . 9, 12,22, 24

The Atomic Energy Act of 1954
Compensations, Awards and Royalties,
Section 157 (b)(3) . . . . . . . . . . . . . . . . . 9, 11,12,22 23, 24, 1,7

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 21098

ALEXANDER T. DEUTSCH,

Appellant,

v.

U. S. ATOMIC ENERGY COMMISSION

Appellee.

Appeal From The Atomic Energy Commission,
Patent Compensation Board

## STATEMENT OF THE CASE

This is an appeal from the denial of a grant of award to appellant upon an application filed with the Atomic Energy Commission in accordance with the Atomic Energy Act of 1954[1]. (R. 5 - 9). The application, filed by appellant pro se on May 13, 1965, with the Patent Compensation Board of the Atomic Energy Commission, and amended as suggested by appellee, set forth appellant's claim that he had invented a process for preserving food through exposure to synthetic radioactive isotopes[2], and that the Commission was encouraging industry to use that process, or a direct modification thereof, for profit purposes without awarding the inventor. (R. 5, 6, 492)

---

[1] United States Code, Title 42 - 2187-(b)-(3), General Rules of Procedure on Applications For Determination of Reasonable Royalty Fee, Just Compensation On the Grant of An Award For Patents, Inventions or Discoveries, A.E.C., Paragraph 80:10(c).

[2] There were 92 natural elements before the discovery of the atomic pile operated by the fission of uranium to develop artificial or synthetic radioactive products. Most of the known 92 elements had more than 1 isotope. Only four natural radioactive isotopes, more prominently radium, were known prior to discovery of the use of the atomic pile to make pure synthetic radioactive isotopes. It was discovered by the Atomic Energy Commission workers that mere exposure of a pure element to neutrons formed in the atomic pile artificially produced additional unstable isotopes of the pure element so exposed. Such unstability became a synthetic source of radioactivity and these radioactive isotopes were sold by the Atomic Energy Commission. Such radioactive isotopes were pure with respect to the starting material originally exposed to neutrons of the atomic pile, and disintegrate each at its own characteristic rate, returning to stable non-radioactive form without inducing secondary radiation in any body that was exposed thereto. For this reason the synthetic radioactive isotopes easily made in the atomic pile became a commercial product distributed by the (cont'd)

In the application appellant pointed out that he had first disclosed his invention in a patent application, assigned serial number 112,833, filed in the United States Patent Office on August 27, 1949 (R. 5, 6). The patent application was filed by appellant pro se; and was ultimately rejected by the Patent Office on the ground that the claims were lacking in invention over certain radium irradiation patents. Appellant failed adequately to respond to the rejection and the application was abandoned in the Patent Office. Thereafter, on discovering that the Atomic Energy Commission was commercially promoting the invention, appellant filed with the Patent Office to revive his application for the same invention, which was denied on April 21, 1965, because of the lapse of time and the previously mentioned abandonment. (R. 873-910)

---

1. cont'd
Atomic Energy Commission by sale. Such product is critically distinguished from "fission material," radioactive ash, resulting from the fission of the uranium into a crude mixture of many products which had no use. Thus, pure radio isotopes are to be distinguished from radioactive ash i.e. mixed disintegration products of radium as referred to in detail (R. ) See Atoms For Peace by David O. Woodberry, pp 149-155.

The invention of appellant's as set forth in the patent application was reported to the Atomic Energy Commission on April 21, 1950 by the Patent Office as required by the Atomic Energy Act and in personal correspondence (R. 21).

The Atomic Energy Commission answered appellant's application for award on September 9, 1965, by stating that appellant had failed to disclose any invention or novel concept, relying upon the same radium irradiation patents as had been cited by the Patent Office; and that the Atomic Energy Commission had not used or caused to be used any of the concepts disclosed in the patent application (R. 21-24). Thereafter the Patent Compensation Board held a full hearing on appellant's claim for compensation on March 15, 1966 (R. 286, 511).

At the hearing appellant proved that he filed the previously mentioned patent application in the United States Patent Office and that he was the first to advocate the preserving of food by either (a) incorporation of synthetic isotopes into the food material to be preserved; or (b) by exposure of food to irradiation by synthetic sources of radioactive material (R. 873-911). He also proved that the Atomic Energy Commission has taken his invention or discovery and, in an insignificantly changed form has induced others and is now actively inducing others to use the process for the profit and benefit of the Atomic Energy Commission and commercial organizations[3]. (R. 492, 683-864).

Appellant also offered proof at the hearing, in the form of testimony, to the effect that during the years 1948 through 1951 approximately, he corresponded with the Atomic Energy Commission for the purpose of convincing the Commission that it should conduct tests concerning appellant's invention (R. 11, 14, 658-664).

At the conclusion of the hearing the Patent Compensation Board first found that appellant's invention was limited in nature in that it only called for the admixture of radioactive isotopes with food as a means of preservation (R. 458-472). The Board stated that

> "(T)he Board cannot agree, if reference to the atomic pile is disregarded, that Deutsch disclosed in his application for patent a procedure involving the irradiation of food by exposing it to rays of

---

[3] See Chemical Week Magazine, September 24, 1966, issue, p.34, where the Editors state that at present the Atomic Energy Commission is spending '...almost 1.7 million a year on the commercialization of irradiated food techniques. Congress has also earmarked $170,000 for pilot-plant design assistance and an additional $230,000 for isotopes...' The article went on to say that millions of dollars will soon be spent in the processing of food by radioactive isotope irradiation and the program will move faster as the Food & Drug Administration approves more irradiated food types. It states that the initial impetus has been by the Armed Forces' purchasing of approximately 300,000 pounds of irradiated food per year at the time the article was written.

> externally located isotopes and, of course, has no evidence before it, except that of Dr. Goldblith, which might tend to indicate what an expert in the art, or skilled scientist, might have concluded had he examined the Deutsch patent application in 1949, or in the following years."[4] (R. 470)

But appellant both disclosed and claimed "exposure" of food to radioactive isotopes (R. 876 & 897).

From the findings that appellant had not shown external irradiation in his patent application and the prescribed strength of the radioactive material was too weak to be effective, the Board concluded that appellant had not made a disclosure of any novel concept (R. 459, 460).

The Board further found that appellant had not corresponded with the Commission concerning his invention, nor had the Commission introduced appellant's process to the commercial world (R. 460, 461). The Board also found that certain

---

[4] Dr. Goldblith testified as an employee of the Atomic Energy Commission and was admitted by appellant to be an expert. But, Dr. Goldblith was not an expert in patent matters and properly did not express an opinion as to whether the patent application disclosed a process for external irradiation. Appellant's contention is that the process presently being advocated by the Atomic Energy Commission is one that a technician would normally arrive at as mere development work performed upon the original Deutsch process. Also, Dr. Goldblith is an expert now, only after long years of experience in this modern development. At the time the appellant made his invention, Dr. Goldblith was personally of the opinion that any irradiation of foods for human use by synthetic radioactive isotopes was dangerous if not lethal, and he published this opinion. See Advances in Food Research, 1951 Procter & Goldblith, p. 156, lines 10-12 (R. 1091). Moreover, the main thrust of Dr. Goldblith's testimony was to the effect that the quantity of radioactive isotopes

(Cont'd)

patent applications filed in the United States Patent Office previous to appellant's, limited appellant's claims to the point of uselessness (R. 462)[5]. The Board concluded that appellant in his patent disclosure was referring to natural atomic isotopes in his patent application because he did not state how ingredients such as isotopic citric acid and gaseous isotopes, as those from carbon and crystallized radioactive sugar, were derived[6] (R. 461, 466).

One of appellant's main assertions before the Board was that the staff of the Atomic Energy Commission included persons skilled in the art of the use of radioactive material

---

4. (cont'd) suggested by appellant was inadequate for the job. On cross examination, he did admit however that the small quantity of radioactive isotopes would destroy some bacteria and, to that extent would have some preservative effect.

[5] The Board was referring to an application by Borst, an employee of the Atomic Energy Commission who had filed a patent application in 1944 proposing use of "fission materials" for food treatment; but, such "fission materials" are radioactive ash, a bi-product formed in the atomic pile during the disintegration of the uranium, and is a lethal and dangerous mixture of radioactive substances which are not pure isotopes, but include other materials which would induce permanent radioactivity in the food. The Atomic Energy Commission to this day goes to great trouble and expense just to bury this radioactive ash in the ground and does not offer it for use or sale as "isotopes" and is in no sense useful for treatment of foods. This Borst application was abandoned (R.260-76). See Atoms for Peace by David D. Woodbury, p.149 - 156, (R. 376-379,402-404)

[6] Obviously the Board was mistaken in its conclusion in that these radioactive materials do not occur naturally but are synthetic.

and that the disclosure in the patent application should have been apparent. That is, that those scientists or experts should have realized that the patent application showed a clear procedure for preserving food by artificial isotopes, but that the Commission viewed the patent application in a very narrow light and in a restrictive way, instead of broadly as required by law.[7.]

In this regard the Atomic Energy Commission now advocates, and either sells or supplies commercial organizations with pure synthetic radioactive isotopes for the treating and preserving of foods. Such process for food preservation as is now used is only an insignificant modification of the process proposed in appellant's patent application (R. 936).

Appellant urged the Board, at the hearing and in many briefs, that the significant fact to be considered was that he was the first to suggest the use of synthetic radioactive isotopes as a source of radiation with which to preserve foods. And, whether the radioactive material was mixed with the food, or held externally, was irrelevant. This is because the radioactive isotopes emitted highly penetrating gamma rays which permeate the food whether mixed with it or the food is merely exposed through the gamma-ray permeable walls of ordinary

---

7. United States Code, Title 42, 2187(c).

containers. The Board, however, expressed its belief that appellant's patent application did not disclose the external treatment of food by anything but natural isotopes[8]. and, for that reason, concluded that what the Commission now advocates is sufficiently different from appellant's invention to make an award or compensation unavailable.

Lastly, the Patent Compensation Board concluded that, even if appellant had made a meritorious contribution to the art of food preservation by the use of radioactive synthetic isotopes, it could not recommend compensation because such an invention was not of the class for which the Act provided compensation. It stated that the Act provides that no compensation can be made unless the discovery was useful in the production of fissionable material or in the utilization of fissionable material or atomic energy for military weapons. The Board rested its decision basically on this last proposition of law (R. 463, 468).

---

[8] "Natural" isotopes are merely the natural radium, and in lessor quantities other natural elements such as actinium, thorium and uranium per se, all very toxic and long discredited for use in foods treatment.

## STATUTES INVOLVED

Atomic Energy Act of 1946, Patents and Inventions:

Section 11 (d):

> "Acquisition of Patents.— The Commission is authorized to purchase, or to take, requisition, or condemn, and make just compensation for, (1) any invention or discovery which is useful in the production of fissionable material or in the utilization of fissionable material or atomic energy for a military weapon, or which utilizes or is essential in the utilization of fissionable material or atomic energy, or (2) any patent or patent application covering any such invention or discovery. The Commissioner of Patents shall notify the Commission of all applications for patents heretofore or hereafter filed which in his opinion disclose such inventions or discoveries and shall provide the Commission access to all such applications."

Atomic Energy Act of 1954, Compensations, Awards, and Royalties:

Section 157 (b)(3):

> "Any person making any invention or discovery useful in the production or utilization of special nuclear material or atomic energy, who is not entitled to compensation or a royalty therefor under this chapter and who has complied with the provisions of section 2181 (c) of this title may make application to the Commission for, and the Commission may grant, an award. The Commission may also, upon the recommendation of the General Advisory Committee, and with the approval of the President, grant an award for any especially meritorious contribution to the development, use, or control of atomic energy."

## SUMMARY OF ARGUMENTS

### I

Appellant's invention for the preservation of foods by exposure to synthetic radioactive isotopes was taken by the Atomic Energy Commission and such invention is now being used by the Atomic Energy Commission for commercial purposes and for such use the inventor-appellant is entitled to a grant of an award in accordance with the statute but which has been improperly denied.

### II

The conclusions of the Patent Compensation Board of the Atomic Energy Commission that results in the Board's denial of a grant of award to appellant were not based on substantial evidence and were arbitrary and capricious:

A. The Board erroneously concluded that appellant's disclosure lacked novelty because his claims were anticipated by the Borst patent application and by certain other patents which show irradiation of food by natural radium compounds.

B. The Board erroneously concluded that the Atomic Energy Commission was not using the invention obtained from appellant.

C. The Board erroneously concluded that appellant only disclosed as his invention the admixture of radioactive isotopes with food as a means of preserving the same and did not disclose the presently approved Food & Drug Administration procedure comprising exposing the food with the radioactive material maintained externally thereof.

D. The Board erroneously concluded that appellant's invention was inadequate for the preservation of food because it disclosed too little irradiation and that the concept advocated by the Atomic Energy Commission today is unlike appellant's invention because it calls for a greater amount of irradiation.

### III

The Patent Compensation Board of the Atomic Energy Commission improperly determined that even if it found that appellant had made a meritorious contribution to the art of food preservation by the use of synthetic radioactive isotopes, it still had no authority to grant an award because the invention did not fall within the terms of the Atomic Energy Commission Act of 1954 in that it was sufficiently limited to ideas useful in the production of fissionable material or in the utilization of fissionable material or atomic energy for military weapons.

## ARGUMENTS

## I.

### Appellant's Invention Is Now Being Used By The Atomic Energy Commission Without Compensation Being Granted

Appellant is entitled to compensation for his invention in that it has been taken over and commercialized by the Atomic Energy Commission. In the September 24, 1966 issue of the Chemical Week Magazine, the editor states that the Atomic Energy Commission is presently spending millions of dollars to develop the process of food preservation by exposure to synthetic radioactive isotopes.

Statutory authority for granting appellant an award for his invention is the Atomic Energy Acts of 1946 and 1954, Sections 11(d)(1) & (2) and 157(b)(3), respectively. The 1946 Act, Sections 11(d)(1) & (2) provides that the Commission is authorized to take any invention or discovery which utilizes fissionable material and to make just compensation for same. The 1954 Act enlarges upon or adds to this by providing for the grant of an award to any person who has made an invention or discovery useful in the utilization of special nuclear material or atomic energy.

First it is clear that appellant's invention was reported to the Commission and that the Commission was aware of it. In the Patent Compensation Board's discussion in this case denying appellant compensation, the Board states that appellant's patent application was formally reported to the Commission (R.15-17, 21, 515-519). At the time appellant's invention was reported to the Commission, it was probably not very receptive to the idea since their expert employee was then of the opinion that irradiation of foods by radioactive isotopes would be harmful to the consumer (R 1091).

It was not until many years later that the Atomic Energy Commission became interested in the preservation of food largely by the urging of some work done by the Quartermaster Corps in the preservation of food (R ). Indeed, the entire development of use of pure radioactive isotopes may have resulted from numerous external pressures brought to bear upon the Atomic Energy Commission but for which it did not hesitate to take the final credit and which brought them great financial return in the increased sale of isotopes (R ). The appellee never has explained in this record and apparently, other than by its examination of appellant's pending patent application papers, cannot explain just where else the concept of preserving food by irradiation with synthetic radioactive isotopes originated.

Notwithstanding these several possible sources which ultimately resulted in the final activity in the Atomic Energy Commission to begin its present large program of inducing private industry to enter the commercial food preservation process by isotopic irradiation (R 492), it is clear that appellant's disclosure in his patent application, which was admittedly seen and reviewed by the Atomic Energy Commission, was the initial source of the idea to preserve food by exposing it to radiation for pure synthetic isotopes.

## II.

### The Board's Basis For Denial Of An Award Was Without Substantial Evidence And Was Arbitrary And Capricious

### A. Appellant's Invention Was Not Anticipated By Other Patents

Certainly the conclusion of the Board, later reduced to more of an implication, that appellant was somehow using only natural radioactive isotopes such as radium and not synthetic radioactive isotopes is such gross error as to warrant calling it capricious. Appellant cited to the Board a simple standard chemical dictionary reference that states categorically that radium is toxic. (R ). Every chemist knows that radium is toxic. This is such common knowledge that most laymen know that radium is toxic. Numerous deaths have occurred in various places in this nation do to industrial workers working with radium. The fact is, anyone exposed to radium or radium materials would be poisoned thereby, a slow but certain death. Consequently, it is clear that the conclusion or implication that somehow appellant was talking about natural radioactive materials such as radium, which is stated as poison, in contrast to synthetic radioactive materials, which is not poison, well supports the charge that the ruling was arbitrary and capricious.

In contrast, appellant taught the use of radioactive citric or radioactive sugar as examples of pure radioactive isotopes and pointed out that these materials are synthesized by commercial laboratories using the pure radioactive isotopes (R ). See particularly, Woodbury, page 194, 197 and 199 (R408-411) whereby it is clear that the appellant's isotopes, as disclosed in his patent application, were in fact pure synthetic isotopes. It should be noted, moreover, that quite a lot of isotopes of various pure elements were made radioactive in the atomic pile by the Atomic Energy Commission and all were distributed to qualified purchasers for various research purposes.

### B. The Atomic Energy Commission Is Using Appellant's Invention

The conclusion that the Atomic Energy Commission was not using the invention obtained from appellant is arbitrary and capricious and ambiguous. If, by this ruling the Atomic Energy Commission Board was implying that appellant was not the source of their information, then it should suffice merely to note that it was the appellant who first proposed the use of pure synthetic radioactive isotopes to preserve food, and there can be no merit in a contention that some other agency was the moving force that impressed the Atomic Energy Commission to promote the sale of isotopes for preservation of food. This is irrelevant as stated above. If, however, the Board intended to state that they were not using any material obtained from appellant because, in fact, they were now offering and encouraging the use of other synthetic radioactive isotopes for preservation of foods, then this is also without merit. It is perfectly obvious that the Atomic Energy Commission made available a large choice of isotopes, any of which researchers could use. Certainly it is arbitrary that the Atomic Energy Commission prefers cobalt or some other isotope rather than radioactive carbon in the form of citric acid as the specific radioactive agent to preserve food. Any of them would operate and, in this respect, the appellant's disclosure was generic. He did not disclose specific radioactive citric acid but rather he disclosed radioactive isotopes of which citric acid was merely one example, naming others such as radioactive sugar. Appellant preferred these as stated for reasons that they could be most compatably mixed with the food, being themselves a typical food component and since the body easily disposed of these substances as it does any food.

However, it is also clear that for the Atomic Energy Commission to select another radioactive isotope, such as radioactive cobalt, from a long list of synthetic radioactive isotopes which were available and promote its use for the preservation of food was no substantial modification of the appellant's invention. This was the purely arbitrary form which appellee proposed to food preservers and which the Food and Drug Administration ultimately approved. The Atomic Energy Commission had an absolute monopoly on the sale and use, by way of license, of any radioactive isotope materials and, consequently, it was arbitrary to select and approve whatever isotopes they preferred. Consequently, the holding of the Board that the Atomic Energy Commission was "not using" any of the material obtained from appellant is, indeed arbitrary and capricious and denies recognition that no particular skill was involved, following the reading of this appellant's disclosure, to select some other isotope of the many available for the very purpose of food preservation as first proposed by appellant.

### C. The Mixing of the Isotopes With the Food

Appellee has most heavily based its case on the urging that most of the substance of appellant's disclosure is directed to adding the isotopes directly to the food. This they proclaim is contrary to what is approved by the Food and Drug Administration (under license of the final authority residing in the Atomic Energy Commission). The Atomic Energy Commission approved the chearpest available isotopes, the so-called "poor man's radium"[9], and the Food and Drug Administration adopted and approved it for public use, first apparently to be used for the usual radium treatment, i.e. cancer, and similarly approving externally exposing the food to the cobalt. Radioactive cobalt is not a material that one would normally take internally and has a very long life and the Atomic Energy Commission and Food and Drug Administration hesitated to mix it with the food, which is quite understandable.

Perhaps the Atomic Energy Commission's proposal to use radioactive cobalt as a species, distinguished from the hundreds of other available radioactive isotopes might have considerable merit, but that does not sufficiently support the position of the appellee that it did not take appellant's invention. That is, appellant's invention is not distinguished by merely shifting to some other of the hundreds of isotopes available, in contrast to the specific ones listed by appellant in his patent application disclosure. Obviously where appellant disclosed that radioactive isotopes in a generic sense could be used to preserve food, and selected as examples some that were idealy admixed with the food i.e., radioactive citric acid or radioactive sugar, because they are harmless, and ingestible as foods to humans, appellee hardly avoids that clear teaching by arbitrary selecting another or others of the hundreds of synthetic radioactive isotopes they had available.

---

[9] Woodbury, page 166.

Moreover, it follows that some isotope may be classified as an objectionable food impurity including cobalt (quite apart from its radioactivity) and would obviously not be used by directly admixing with the food; that is, it would be used only by external exposure of the food to the cobalt. However, the difference between exposing the food to the isotopes with the isotope held externally because it is otherwise an undesirable component of the food, or to put the isotope in the food because it is harmless, for the same irradiation purpose to destroy micro organisms therein and preserve the food, are both quite obvious variations to anyone skilled in this art, and hardly avoids the basic teaching of appellant that an isotope, however used, will destroy bacteria when the food is "exposed" thereto. The fact is quite elementary on careful reading of appellant's patent application as quoted in the record. The application disclosure at page 1, lines 14 through

17 (R 5) recites exposing the food "with a limited amount of radioactivity, the chosen liquid, plastic or stiff body can be exposed to the atomic pile, a rather complicated and expensive process, or it can be processed under use of gases or crystallized or other isotopes processed under use of limited radioactivity..." (Emphasis added). The specification goes on to list radioactive citric acid and sugar as examples. In claim 8 appellant recites broadly "exposure" of the food to the radioactive material. It is obvious that only in the instance of edible products, such as radioactive citric acid and sugar, would the examples of admixing the product with the food be valid. Consequently, it is appellant's position that no distinction other than would be obvious to anyone skilled in the art is present in appellee's modification that the food will be preserved by external exposure to radioactive cobalt. Hence, appellant urges that the appellee's position denying a grant of award to appellant on the basis that the process followed by appellee is an external irradiation of food whereas appellant teaches only admixture of a radioactive material with the food is arbitrary and capricious.

### D. The Quantity of Irradiation

This reason urged in denial of a provisional award to appellant by appellee, namely that the disclosure of the appellant included a much smaller quantity of radioactive isotopes than is approved by the Atomic Energy Commission where radioactive cobalt is used in a higher concentration, again is quite arbitrary. There is nothing critical in the quantity of radioactive isotopes used to destroy the micro organisms and preserve the food. The radioactive material emits high velocity gamma rays and when a gamma ray strikes a micro organism it destroys it. Obviously if there is only a little radioactive material used, there is a lower concentration of these rays present to which the food and bacteria therein are exposed. There then will be fewer impacts and, consequently, less destruction of the bacteria by the lower concentration of radioactive material. One skilled in the art would understand this and more particularly appellant understood such principal quite well. It should be emphasized that where one of such high degree of skill, the best available in the country at that time for this new art, reads or has access to a patent disclosure which proposes to destroy bacteria by exposing food to radioactive isotopes, its complaint following years of research that the disclosure proposed too little radioactive isotopic material as compared to what they now recommend some fifteen years later is hardly valid. Certainly it is an expected distinction that would result from a most modest amount of applied development work to appellant's original proposal.

The great Louis Pasteur proposed partial sterilization of fluids, typically milk, by heating. This process is known as pasteurization. It is doubtful that the practice of today of heating to exactly 65°C for more than 30 minutes is the exact method proposed so long ago by Pasteur. Perhaps the method proposed long ago is still known as pasteurization because no one was available to argue that the great Pasteur made no contribution by failing to recite exactly 65°C for at least 30 minutes.

## III.

## The Authority Of The Patent Compensation Board

The Patent Compensation Board of the Atomic Energy Commission held that appellant was not entitled to compensation even if it entertained the belief that appellant had made a meritorious contribution to the art of food preservation. (R ). The Board relied on the 1946 Act, Section 11(e), and the 1954 Act, Section 157(b)(3). A review of these sections disclose that appellee's view of the law concerning compensation is not in accord with what Congress had in mind. To say that Congress has granted the Atomic Energy Commission the broad right to take and use inventions but, in some cases, has not provided for compensation is to say that Congress passed an unconstitutional law. That is not the case.

The Board argues that Section (e) (2) (A) and (B) of the 1946 Act limits compensation to either "royalties" or "just compensation" for patents which are licensed or inventions useful in connection with military operations or the production of fissionable material. It seems that the distinction drawn by the Board is that an invention is either useful in the production of fissionable material or for a military weapon, in which case it cannot be patented and in which case there must be compensation. Or, it is a patented invention utilizing fissionable material for non-military purposes in which case it can be licensed or taken for either a royalty or just compensation.

According to the Board, there are only two other types of compensation. They are for a person qualifying under Section (e)(2)(c) and that concerns an invention that is not patented. In such a case the Board states it can only compensate for a non-patented invention if it is useful in the production of fissionable material or in a military weapon. The next and last type of compensation is under Section 157(b)(3) of the 1954 Act. The Board argues that under the new Act it can only compensate if the invention or discovery is "useful in the production or utilization of special nuclear material or atomic energy".

The Board then rationalizes that appellant's invention is not patented and is not useful in the production of fissionable material or military weapons and as such does not qualify under the 1946 Act. Also, they say it does not utilize special nuclear material or atomic energy and therefor is disqualified under the 1954 Act. With regard to the 1954 Act, the Atomic Energy Commission was granted the right to define "special nuclear material" and "atomic energy" Section 11(c) and (t).

But the enabling Acts are not as restrictive as indicated by the Board. A patent does not have to issue to permit a person to qualify under Section 11(e)(2)(b) for just compensation. That section allows for just compensation if an individual has made an invention as described in Subsection (a) (b) or (d). Subsection (d) allows the Commission to purchase, take, requisition or condemn and make just compensation for any "patent or patent application" useful in the utilization of fissionable material.

It is clear that appellant has made an invention for which he supplied for a patent that is useful in the utilization of fissionable material.

Lastly, appellant also contends that he qualified under the 1954 Act since his invention does use special nuclear material or atomic energy. The term atomic energy is defined as "all forms of energy released in the course of nuclear fission or nuclear transformation" (R ). Certainly, it cannot be seriously argued that radioaction isotopes, such as citric acid and sugar, do not obtain there energy or release their energy in the course of nuclear fission or nuclear transformation. Additionally, it is further contended that the Atomic Energy Commission cannot lawfully defind "special nuclear material" to exclude the material used by appellant, if such exclusion is the sole reason for the denial of an award on an otherwise meritorious claim.

# CONCLUSION

It is respectfully submitted that the decision of the Patent Compensation Board should be reversed and it should be instructed to compensate the appellant.

Respectfully submitted,

Sol B. Wiczer

H. Thomas Sisk

M. Michael Cramer

1030 - 15th Street, N. W.
Washington, D. C. 20005
223-2555

Attorneys for Appellant

# CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing typewritten Brief for Appellant, was mailed, postage prepaid, this _____ day of March, 1968 to Norman Knopf, Attorney for the Appellee, Justice Department, Civil Division, Appellate Section, Washington, D. C. 20530.

H. Thomas Sisk

# BRIEF FOR RESPONDENT

---

## IN THE UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

United States Court of Appeals
for the District of Columbia Circuit

FILED MAY 2[illegible] 1968

Nathan J. Paulson
CLERK

No. 21098

ALEXANDER T. DEUTSCH,

Petitioner,

v.

UNITED STATES ATOMIC ENERGY COMMISSION,

Respondent.

PETITION FOR REVIEW OF AN ORDER OF THE PATENT COMPENSATION BOARD OF THE ATOMIC ENERGY COMMISSION

EDWIN L. WEISL, Jr.,
Assistant Attorney General,

JOHN C. ELDRIDGE,
MICHAEL C. FARRAR,
Attorneys,
Department of Justice,
Washington, D. C. 20530.

## QUESTION PRESENTED

Whether the decision of the Patent Compensation Board of the Atomic Energy Commission denying petitioner an award on the ground that he did not make any discovery useful in the utilization of special nuclear material or atomic energy has substantial record support.

# INDEX

Page

Question Presented ---------------------------------- 1
Counterstatement of the Case ------------------------ 1
Statutes Involved ----------------------------------- 7
Summary of Argument --------------------------------- 8

Argument:

The Decision of the Patent Compensation Board of the Atomic Energy Commission that Petitioner made no Discovery that Entitles Him to an Award has Ample Record Support ---------------------- 10

A. The Board Correctly Found a Lack of Novelty in Petitioner's Disclosures ------ 13

B. The Board's Findings that the Methods Disclosed by Petitioner were neither Used nor Useful were Fully Justified ----- 15

Conclusion ------------------------------------------ 25
Appendix -------------------------------------------- 1a

## CITATIONS

Case:

Fletcher v. United States Atomic Energy Commission, 192 F. 2d 29, 89 U.S. App. D.C. 218, 221, certiorari denied, 342 U.S. 914 --------------------------------10,20

Statutes:

Atomic Energy Act of 1946:

42 U.S.C. (1952 ed.) 1811(d), Sec. 11(d)---- 3,7
42 U.S.C. (1952 ed.) 1811(e)(2)(C), Sec. 11(e)(2)(C) ---------------------- 4,10

Page

**Statutes:** (Continued)

Atomic Energy Act of 1954:

42 U.S.C. 2014(c), Sec. 11(c) -------------- 8,10
42 U.S.C. 2187, Sec. 157 ------------------- 1,7
42 U.S.C. 2187(b)(3), Sec. 157(b)(3) ---- 3,4,10,20
42 U.S.C. 2187(c), Sec. 157(c) ------------- 4
42 U.S.C. 2239(b) ------------------------- 1

Federal Food, Drug and Cosmetic Act:

21 U.S.C. 301, 342(a)(2) and (7) ----------- 22

28 U.S.C. (1964 ed., Supp. II) 2341 *et seq.* ----- 1
28 U.S.C. (1964 ed., Supp. II) 2344 ------------ 1

35 U.S.C. 101 ------------------------------ 10

**Miscellaneous:**

10 C.F.R. 80.61(e) ------------------------- 2
21 C.F.R. 121.3001 *et seq.* --------------------- 22

Federal Radiation Council, Report # 1 of the, *Background Material for the Development of Radiation Protection Standards*, May 13, 1960, p. 7 ------------------------------ 18

Glasstone, *Sourcebook on Atomic Energy* ---------- 20

Pub. L. 86-373 (73 Stat. 688) ------------------ 11

S. Rep. 870, 86th Cong., 1st Sess., p. 4 -------- 11

IN THE UNITED STATES COURT OF APPEALS FOR
THE DISTRICT OF COLUMBIA CIRCUIT

---

No. 21098

ALEXANDER T. DEUTSCH,

Petitioner,

v.

UNITED STATES ATOMIC ENERGY COMMISSION,

Respondent.

---

PETITION FOR REVIEW OF AN ORDER OF THE PATENT COMPENSATION
BOARD OF THE ATOMIC ENERGY COMMISSION

---

# BRIEF FOR RESPONDENT

---

## COUNTERSTATEMENT OF THE CASE

Petitioner, Alexander T. Deutsch, seeks review, pursuant to 42 U.S.C. 2239(b) and 28 U.S.C. (1964 ed., Supp. II) 2341 [1/] et seq., of a final decision of the Atomic Energy Commission rejecting his claim for an award under Section 157 of the Atomic Energy Act of 1954, 42 U.S.C. 2187. Petitioner claims that it was a discovery of his that led to the utilization of

---

[1/] Under 28 U.S.C. (1964 ed., Supp. II) 2344, the proper respondent in this review proceeding is the United States of America.

atomic energy to sterilize and preserve food. His claim for an award for that alleged discovery was the subject of intensive consideration by the Commission's Patent Compensation Board. That Board found that petitioner was not entitled to an award, and the Commission denied a request that it review the Board's determination.[2] The facts underlying petitioner's claim and the Board's determination are as follows:

Petitioner filed a patent application with the United States Patent Office on August 27, 1949 (Op. 1).[3] That application, Number 112,833, was for "Radioactive Products" and is set out *infra*, App. 1a-5a.[4] Essentially, the application covered (App. 1a):

> a method and its practical applications to provide food * * * with an amount of radioactivity, strong enough to have healing consequences and not to [sic] strong to dammage [sic] the human body * * *.

---

[2] Thereupon, under 10 C.F.R. 80.61(e), the decision of the Board became the final action of the Commission.

[3] "Op." references are to the pages of the opinion, captioned "Findings of Fact, Determination and Statement of Reasons", of the Patent Compensation Board. "Tr." references are to the pages of the transcript of the evidentiary hearing before the Board on March 15, 1966. "Ex." references are to the Exhibits introduced at that hearing by the Applicant and by the Office of the General Counsel of the Commission. On December 11, 1967, this Court ordered that the parties should file three copies of the pertinent parts of the record by the time the reply brief is due, instead of printing a joint appendix.

[4] "App." references are to the Appendix to this brief. Although the patent application was amended twice, we set out in the Appendix only the original application, encompassing claims 1-7, for the subsequent amendments were concerned with industrial products only.

The application disclosed two methods by which the desired effect could be obtained (App. 1a):

> the choosen [sic] liquid, plastic or stiff body can be exposed to the atomic pile * * * or it can be processed under use of gazeous [sic] or crystallized or other isotopes of limited radioactivity.

The application went on to explain that the processing referred to was "the gradual incorporation of * * * isotopes into the product * * *." (App. 3a, Claim 2; see also App. 1a-2a; App. 4a, Claims 4 and 5). After full consideration, the Patent Office issued a final rejection in 1951 of all the claims in the application and petitioner abandoned the application. 5/ The grounds for the rejection were that the claims were "indefinite, vague and lacking invention" over prior patents and prior art, for the art showed "the treatment of various substances with the emanations from radium and radio-active substances." Deutsch Patent Application File, Document No. 10; see also id., Documents No. 3, 5, and 7.

In 1965, petitioner filed an application for an award with the Patent Compensation Board of the Atomic Energy Commission. 6/

---

5/ The Patent Office denied petitioner's 1965 attempt to revive the application.

6/ Petitioner asked for compensation. Both the 1946 and 1954 Atomic Energy Acts provided three types of monetary benefits--just compensation, royalties and awards--each applicable to different circumstances. Under the 1954 Act, the claim is properly one for the "award" provided for under Section 157(b)(3), 42 U.S.C. 2187(b)(3), for a person making an invention or discovery useful in the utilization of special nuclear material or atomic energy. The Board correctly considered petitioner's claim under that provision. That provision is, insofar as petitioner's claim is concerned, the functional equivalent of Section 11(d) of the 1946 Act, 42 U.S.C. (1952 ed.) 1811(d), infra, p. 7 , which provides "just compensation" for, (Continued)

He sought recovery under Section 157(b)(3) of the Atomic Energy Act of 1954, 42 U.S.C. 2187(b)(3), which provides (infra, p. 7) that "Any person making any invention or discovery useful in the * * * utilization of special nuclear material or atomic energy * * * may make application to the Commission for, and the Commission may grant, an award." 7/

In his claim, petitioner pointed to the expanding development in the field of food sterilization and preservation through exposure of food to radioactive isotopes. In essence, his claim for an award stemmed from his belief that the disclosures in his patent application, and in correspondence which he alleges he engaged in with the Atomic Energy Commission, led to the successful development of that field. After a full evidentiary hearing, the Patent Compensation Board rendered an opinion in which it determined that petitioner was not entitled to an award.

---

(Continued)

inter alia, circumstances where the Commission took an invention or discovery which utilized atomic energy. Accordingly, the Board's decision, although based on the "award" provisions of the 1954 Act, applies with equal force to the "just compensation" provisions of the 1946 Act. Petitioner could have no claim under the 1946 Act for the "award" which was then provided for under Section 11(e)(2)(C), 42 U.S.C. (1952 ed.) 1811(e)(2)(C), for an invention or discovery useful in the production of fissionable material or in the utilization of fissionable material or atomic energy for a military weapon.

7/ Section 157(c) of the Act, 42 U.S.C. 2187(c), lists the factors to be taken into account, once the conditions necessary to the grant of an award have been found to be satisfied, in determining the amount of such an award.

Based on the evidence presented, the Board found as a fact that the correspondence alleged by petitioner to have been conducted between himself and the Commission "did not occur" (Op. 3, Finding No. 8; see also Op. 10-11).[8/] Thus the Board based its consideration of petitioner's claim only on the disclosures in his patent application.

Petitioner's patent application disclosed a general concept, sterilization of food through irradiation,[9/] as well as specific methods for effectuating that concept. In explaining its reasons for denying an award to petitioner based on its findings of fact, the Board first noted that it appeared that petitioner was "recommending the use of naturally radioactive materials" (Op. 8; see Op. 3, Finding No. 7). The Board concluded that if petitioner advocated the use of only such substances, he would not be eligible for an award for he would not have "dealt with, in his work, special nuclear material or atomic energy within the import of the Atomic Energy Acts" (Op. 9-10).

The Board went on, however, to examine petitioner's patent application on other and independent grounds (Op. 10). In so doing, the Board noted that at the time of petitioner's disclosure the Commission already had the knowledge disclosed by the prior patent application of one Lyle B. Borst concerning "Preservation of Foodstuffs" (Op. 13).[10/] Accordingly, in

---

[8/] In addition, petitioner had introduced no evidence of the content of the alleged correspondence.

[9/] "Irradiation" is the treatment of a substance by exposure to radiation, which is any type of wave or particle energy.

[10/] Not only the Borst application but also many other and older patents and applications were cited to the Board as antedating petitioner's alleged disclosure.

the Board's opinion, petitioner's disclosure was not novel except for a limited aspect of the specific methods he advocated (Op. 14). The Board similarly rejected petitioner's argument that his disclosures led to future developments discernible to those "skilled in the art" for those developments were traceable not to petitioner's disclosures but to prior disclosures (Op. 13-14).

With respect to the specific methods claimed by petitioner, the Board found that that application disclosed only two methods: exposing food to an atomic pile [11] and mixing food with radioactive isotopes (Op. 2-3, Finding No. 7). Not only had Borst, however, previously disclosed to the Commission exposure to an atomic pile and admixture with radioactive substances (Op. 13), but the Board also found that neither of those two methods by which food can be irradiated is used in the processing of food (Op. 4, Finding No. 13). [12] In addition, the Board noted that the only novelty in petitioner's disclosure, the specific amount of radiation applied (Op. 14), would not accomplish the result advocated by petitioner, for the limited total dosage of radiation petitioner prescribed fell far short of the level necessary to pasteurize, sterilize or preserve food (Op. 4, Finding No. 15). It could, in fact, achieve a contrary result because such a dosage, insufficient to kill bacteria, could produce mutant strains of radiation resistant bacteria (Ibid.).

---

[11] An atomic pile is a structure in which, by a controlled chain reaction, atoms of a fissionable material, such as uranium, can be split. The structure may be, for example, a latticework of rods of uranium and rods of a control material surrounded by a moderating material. The operation of an atomic pile is explained *infra*, pp. 21-22.

[12] Testimony at the hearing was to the effect that not only were the two methods not used but also that they could not be used, for they would result in the ingestion of radioactive substances. See Tr. 89, 115; *infra*, pp. 22-23.

Accordingly, the Board denied petitioner's application for an award.

## STATUTES INVOLVED

Section 11(d) of the Atomic Energy Act of 1946, 42 U.S.C. (1952 ed.) 1811(d), provided:

> The Commission is authorized to purchase, or to take, requisition, or condemn, and make just compensation for, (1) any invention or discovery which * * * utilizes or is essential in the utilization of fissionable material or atomic energy, or (2) any patent or patent application covering any such invention or discovery. The Commissioner of Patents shall notify the Commission of all applications for patents heretofore or hereafter filed which in his opinion disclose such inventions or discoveries and shall provide the Commission access to all such applications.

Section 157 of the Atomic Energy Act of 1954, 42 U.S.C. 2187, provides:

> § 2187. Compensation, awards, and royalties--
> Patent Compensation Board
>
> (a) The Commission shall designate a Patent Compensation Board to consider applications under this section. * * * *
>
> * * * * *
>
> (b)(3) Any person making any invention or discovery useful in the production or utilization of special nuclear material or atomic energy, who is not entitled to compensation or a royalty therefor * * * may make application to the Commission for, and the Commission may grant, an award. * * *

Section 11(c) of the Atomic Energy Act of 1954, 42 U.S.C. 2014(c), provides:

> The term "atomic energy" means all forms of energy released in the course of nuclear fission or nuclear transformation.

## SUMMARY OF ARGUMENT

A person seeking an award under the Atomic Energy Act must show that his alleged discovery is new and useful and that it has been used. Further, the discovery must have been useful in the utilization of atomic energy. Although the Patent Compensation Board believed that petitioner's alleged discovery did not merit an award because it did not utilize atomic energy within the meaning of the Act, it went on to consider his claim as though his alleged discovery did utilize atomic energy. On that basis, the Board concluded that no award could be granted, for petitioner's disclosures were not new, had not been used, and lacked usefulness. Although, as we point out, both grounds for decision are correct, we defend the Board's decision on the broad ground of the complete lack of discovery in petitioner's disclosures.

A. The disclosures in petitioner's patent application lacked novelty. The idea he disclosed, sterilization of food by irradiation, had been often disclosed prior to his formulation of it. The methods he disclosed had been anticipated by the prior patent application of Lyle B. Borst. The only novelty in petitioner's disclosure was the amount of radiation to be used.

B. In their entirety, including the aspect of the amount of radiation to be used, the methods disclosed by petitioner were not used and lacked usefulness. He disclosed only two methods in his patent application, exposure of food to an atomic pile and admixture of food with radioactive isotopes. He did not disclose a method presently used, external exposure of food to radioactive isotopes. In addition, the external exposure method cannot be attributed to him as an obvious development from his disclosure, for that method is foreign to the basic concept of his disclosure, the incorporation of radioactivity into food. Further, the external exposure method traces its derivation to disclosures which were prior to petitioner's.

The uncontradicted evidence showed that the two methods petitioner did disclose have not been used. This is not surprising, for both those methods result in the ingestion of radioactive substances into the body and are, therefore, without utility. In addition, the only novelty in petitioner's disclosure, the precise level of radiation to be used, created an additional danger, for that level not only was far too low to be effective in preserving food but also could produce mutant bacteria resistant to radiation.

## ARGUMENT

### THE DECISION OF THE PATENT COMPENSATION BOARD OF THE ATOMIC ENERGY COMMISSION THAT PETITIONER MADE NO DISCOVERY THAT ENTITLES HIM TO AN AWARD HAS AMPLE RECORD SUPPORT

It is fundamental that a person claiming to have made an invention or discovery must show that his proposal is both new and useful. 35 U.S.C. 101; 42 U.S.C. 2187(b)(3). And under the Atomic Energy Act, use of the discovery must have been made. Fletcher v. United States Atomic Energy Commission, 192 F. 2d 29, 33, 89 U.S. App. D.C. 218, 221, certiorari denied, 342 U.S. 914.[13/]

In addition, to justify an award under the Atomic Energy Act, the discovery must have been useful in the utilization of "atomic energy." 42 U.S.C. 2187(b)(3). The Board believed that the petitioner advocated a use of only naturally radioactive substances and concluded that it could not properly consider such a use to be a utilization of atomic energy. Although the term "atomic energy" is defined in Section 11(c) of the Act, 42 U.S.C. 2014(c) (supra, p. 8), to include all forms of energy released in the course of nuclear transformation, and naturally

---

[13/] In Fletcher, this Court interpreted the "award" provision, Section 11(e)(2)(C) of the 1946 Act, 42 U.S.C. (1952 ed.) 1811(e)(2)(C), and held that use of the discovery must have been made in order to justify recovery under that provision. Despite the differences between the "award" provisions of the 1946 and 1954 Acts (see footnote 6, supra), the Fletcher holding that a discovery must have been used would seem to extend to the "award" provision of the 1954 Act and, of course, to the "just compensation" provision of the 1946 Act.

radioactive substances emit radiation by such transformation, the Commission has never considered the Act to give it regulatory power over naturally radioactive substances. 14/ By parity of reasoning, the Board properly concluded it could not grant an award based on the utilization of such a substance.

Petitioner does not appear to have serious disagreement with that conclusion. He does, however, question the premise upon which it is based, that is, that petitioner's patent application disclosed the use of only naturally radioactive isotopes. We believe the Board was justified in reading that patent application as not disclosing the use of synthetic radioactive isotopes (Op. 3, Finding No. 7), for the application was silent as to the source of the radioactive isotopes. The Board found, however, that even if it assumed that the isotopes referred to would permit the granting of an award if the alleged discovery were otherwise meritorious, petitioner did not merit an award for the entirely independent reasons that his disclosures lacked novelty and utility. In that ground for its decision, then, the Board found that petitioner had made no discovery or invention of any kind. Because that finding broadly rejects

---

14/ Congress has expressed a similar understanding. By Pub. L. 86-373 (73 Stat. 688), the Act was amended to permit the transfer of certain powers of the Commission. The Senate Report accompanying the bill noted that the bill had been redrafted "to make it clear that it does not attempt to regulate materials which the AEC does not now regulate under the Atomic Energy Act of 1954 * * * * such as * * * radium." S. Rep. 870, 86th Cong., 1st Sess., p. 4.

petitioner's claim and is so plainly correct, we will, in this brief, defend the Board's decision on that ground rather than on the narrower ground, which we also believe to be meritorious, that petitioner's disclosures did not concern the utilization of atomic energy. 15/

---

15/ The Board rejected petitioner's allegation that he had supplemented the disclosures in his patent application by correspondence with the Commission (Op. 3, Finding No. 8; Op. 10-11). Accordingly, the Board limited its consideration of petitioner's claim to the disclosures in that patent application. Petitioner does not argue in his brief that the Board's finding in this respect was erroneous. In his Petition for Review (pp. 3-5), however, he submitted that this finding was erroneous, and in his Statement of the Case (Brief of Appellant, pp. 3, 4, 5) he refers to his allegations and the Board's finding with regard to the correspondence. In any event, the Board's finding that there was no such correspondence is amply supported by the evidence.

Petitioner was unable to produce any of the alleged correspondence and offered no information concerning with whom or with what branch he had corresponded. His own minimal attempts to discover records of the alleged correspondence were unsuccessful (Tr. 24). Although they were handicapped by lack of any information from the petitioner, the attorneys for the Commission conducted a diligent search of the Commission's files for evidence of any such correspondence. They communicated with various divisions and branches of the Commission in an attempt to uncover any records of such correspondence (Tr. 22-23), but all replies were negative (Tr. 23). In addition, the records of the Commission itself and of the Office of the Assistant General Counsel for Patents were searched unsuccessfully (Tr. 25).

In view of these circumstances, the Board's finding that the alleged correspondence "did not occur" was not only permissible but was indeed required. Thus the Board correctly judged petitioner's claim for an award solely on the information disclosed in his patent application.

Petitioner's patent application discloses a concept and methods for its effectuation. In determining that petitioner had made no discovery or invention of any kind which could merit an award, the Board found that the concept and, except to a very limited extent, the methods, were not new and that to no extent were the methods used or useful. Both those findings were eminently correct.

### A. The Board Correctly Found a Lack of Novelty in Petitioner's Disclosures

The concept disclosed by the petitioner's application is "to provide food * * * with an amount of radioactivity, strong enough to have healing consequences and not to [sic] strong to dammage [sic] the human body" in order that the food "can be kept bacteria free" (App. 1a). The methods advanced for the effectuation of that concept were exposure of food to the atomic pile or admixture of food with radioactive isotopes (App. 1a). Essentially, petitioner's position is that his application was the breakthrough upon which was formulated the entire process of sterilizing and preserving foods through irradiation. Petitioner ignores, however, that the ideas he disclosed had been often disclosed long prior to his formulation of them. The Board found, accordingly, that the concept and, to a great extent, the methods disclosed for its effectuation, were not new. Although a number of prior patents anticipated petitioner's disclosures, [16] the Board focused on the prior Patent Application No. 552,558 of one Lyle B. Borst (O.G.C. Ex. V) to demonstrate the absence of novelty in petitioner's disclosures.

The Borst application, filed on September 2, 1944, broadly concerned the utilization of radiation "for the destruction of bacteria, and thereby [to] obtain sterilizing and other effects in foodstuffs" (O.G.C. Ex. V, p. 16; Borst Appl. p. 1, lines 21-24). As originally submitted, the application envisioned that the radiation utilized would emanate from an atomic pile chain reaction or from the radioactive products of such a fission process. [17] After the Patent Office indicated that the "use of wave energy to sterilize foodstuffs is clearly old" (O.G.C. Ex. V, p. 26) the Borst application was amended on June 7, 1949 (_Id_., p. 32). By that amendment, Borst added two more methods for sterilizing food by irradiation. Those methods involved incorporation of radioactive material into food. [18] Again the Patent Office indicated the claims lacked invention over prior art. Borst later abandoned the application after an abstract thereof was published (Id., pp. 58-61).[19]

---

[16] The Board noted that the Patent Office had rejected petitioner's application for a patent on the ground, _inter alia_, that the claims were lacking invention over a number of prior patents, including two as early as 1905 and including patents from other countries. Op. 1-2, Finding No. 3.

[17] These isotopic products of atomic fission emit radiation in the same manner as isotopes made radioactive by exposure to the fission process. See discussion, _infra_, p. 21.

[18] This radioactive material would appear to include both the fission products previously referred to by Borst as well as isotopes made radioactive by exposure to an atomic pile. See footnote 17, _supra_.

The Borst application clearly disclosed the general concept of sterilization of food through irradiation. In addition, its disclosures included those methods later disclosed by petitioner, i.e., exposure of food to an atomic pile and admixture of food with radioactive substances (see discussion infra, pp. 16-17). Thus, except for its reference to the amount of radiation to be used, the Deutsch application disclosures were not new, for they contained nothing other than information previously disclosed by Borst. And the Patent Office considered the Borst application itself as lacking novelty over earlier disclosures. Accordingly, petitioner's disclosures, except for the limited reference noted above, i.e., to the amount of radiation to be used, were totally devoid of novelty.

### B. The Board's Findings that the Methods Disclosed by Petitioner were neither Used nor Useful, were Fully Justified

We have shown that the Board correctly found an almost total lack of novelty in petitioner's disclosure. We show below that in their entirety, including the limited aspect which might be considered novel, the methods disclosed by petitioner for irradiating food were neither used nor useful and that, accordingly, the Board was justified in denying petitioner an award. Before showing that petitioner's method disclosures were not useful, however, we demonstrate that the Board properly rejected petitioner's attempt, in pursuing his claim for an award, to ignore the specific language of his patent application and to add another method to the methods disclosed therein.

---

[19] That abandonment by Borst, just the same as the abandonment by Deutsch of his application, did not, of course, deprive the Commission of the information disclosed by his application.

1. Petitioner's patent application proposed two methods by which food could be "provide[d] * * * with an amount of radioactivity" (App. 1a): "the choosen [sic] liquid, plastic or stiff body can be exposed to the atomic pile * * * or it can be processed under use of gazeous [sic] or crystallized or other isotopes of limited radioactivity" (Ibid.). The application went on to make clear that by the latter method petitioner contemplated "the gradual incorporation of isotopic substances * * * into the product during its processing stage" (App. 4a, Claim 4; see also App. 3a, Claim 2; App. 4a, Claim 5; App. 1a-2a).

In pursuing his claim for an award, however, petitioner ignored the specific language of his patent application and attempted to add a third method, the exposure of the food to radioactive isotopes in an external manner [20] rather than by admixture.

---

[20] This is one of the methods for irradiation of food which is presently in use.

The Board rejected that attempt to broaden the disclosures of the patent application to add a third method. It was unable to agree with petitioner's contention that he "disclosed in his application for patent a procedure involving the irradiation of food by exposing it to the rays of externally located isotopes" (Op. 12). The Board accordingly found that "There is no teaching in the Deutsch patent application to the effect that [subjecting the food to isotopes] may be attained in any manner other than by adding the isotopic substances to the substances being processed" (Op. 2-3, Finding No. 7).[21] Thus, the Board considered only the two methods for irradiation of food fairly disclosed by the patent application, i.e., exposure to the atomic pile and admixture with radioactive isotopes.

In attacking the Board's refusal to credit him with disclosing a third method, i.e., external exposure to radioactive isotopes, petitioner admits that a distinction between the method of admixture which he did disclose and the presently used method of external exposure which he did not disclose exists but he asserts that the distinction is and would have been obvious to anyone skilled in the art (Pet. Brief, pp. 19-20).[22] That approach is unavailing.

---

[21] That was also the interpretation an expert witness put upon the application (Tr. 65).

[22] At page 20 of his brief, petitioner asserts that he did disclose "'exposure' of the food to the radioactive material" in Claim 8 of his patent application. That assertion is mistaken, for Claim 8, added in 1950, covered industrial products only, not food.

First, it appears that at the time he filed the patent application, petitioner himself would have rejected the external exposure method. His entire concept was based on incorporation of radioactivity into food, either by exposure to the atomic pile, which would render the food itself radioactive (see discussion *infra*, p. 23 ), or by mixing a radioactive substance with the food, which would mean that a portion of the ingested material would be radioactive. The notion of external exposure to radiation, which would not render the ingested matter radioactive, is foreign to the tenor of petitioner's patent application.[23/]

Further, it is apparent that petitioner's claim that the Board should have considered the external exposure method to be derived from the admixture method which he disclosed is, in reality, just a disguised version of his claim that his disclosure of the concept of food irradiation was something new. We have already shown that the concept of preservation of food by irradiation disclosed by petitioner was not novel but rather had been often anticipated. And Borst had specifically disclosed the use of synthetically created radiation, rather than the naturally occuring radiation disclosed by the earlier patents and patent applications, to preserve food. The method of external exposure of food to synthetic radioactive isotopes thus

---

23/ Petitioner envisioned that the ingestion of radioactive material would have a healing effect on the human body. The contrary is true, for in addition to its destructive effect (*infra*, p. 22 ) such material may produce cancer. See Report # 1 of the Federal Radiation Council, *Background Material for the Development of Radiation Protection Standards*, May 13, 1960, p. 7.

traces its derivation to disclosures, particularly those by Borst, which were prior to petitioner's. Petitioner's disclosures added nothing to those prior disclosures, and the improvements derived from those prior disclosures should not be attributed to any contribution of petitioner's. Indeed, as we have noted above, the external exposure method does not result in the ingestion of radioactive material, and it was Borst, but not petitioner, who attempted to adapt his methods to prevent ingestion of radioactive material by choosing for admixture substances with a short half-life, that is, substances whose emission of radiation would naturally become negligible prior to ingestion.[24]

The method of food preservation by external exposure to radioactive isotopes cannot, then, be attributed to any disclosures made by petitioner. The Board was correct in limiting its consideration of petitioner's claim to the two methods fairly disclosed in his patent application.

2. We now turn to a consideration of the Board's determination that the Commission had not used either of those two methods of food irradiation and that the methods were not useful. The Board found as a fact that the Commission does not use the methods disclosed by petitioner (Op. 4, Finding No. 13).

---

[24] The half-life of a radioactive isotope is the length of time in which the radioactivity of a given amount of the isotope will decay to half its initial value. After the expiration of ten half-lives, only 0.1% of the original activity remains.

Petitioner can scarcely attack this finding, for the Commission denied that the methods were used (Tr. 16, 22) and there was no evidence to the contrary before the Board. In fact, petitioner admitted to being unable to prove the contrary (Tr. 16-17). As we explain below, the two methods disclosed by petitioner are so patently lacking in utility that there is no reason to question the validity of the finding that the methods were not used. 25/ Both because the methods he disclosed were not used (see Fletcher v. United States Atomic Energy Commission, supra, p. 10, 192 F. 2d at 33, 89 U.S. App. D.C. at 221) and were not useful, petitioner could not be granted an award. 42 U.S.C. 2187(b)(3).

The two methods for food irradiation disclosed by petitioner both result in the ingestion of radioactive substances into the body. As we have previously noted, they are, therefore, without utility. A brief explanation of the scientific principles concerning radioactivity will make this clear. 26/

The nucleus of an atom contains two types of particles, protons and neutrons, which are of similar mass. Atoms of the various elements are distinguished by the number of protons in the nucleus. Protons carry a positive electrical charge;

---

25/ Petitioner seems to misunderstand the basis for that finding. The basis is that the two specific methods disclosed were not being used in any manner, and not, as petitioner suggests in his brief (pp. 16-17), that the Commission was using those methods and had merely substituted isotopes of different elements or compounds for those suggested by petitioner.

26/ A thorough treatment of this subject may be found in Glasstone, Sourcebook on Atomic Energy.

neutrons have no electrical charge. In addition to the particles in the nucleus, each atom has a number of electrons equal in number to the number of protons, traveling in orbits about the nucleus. Electrons are of negligible mass and carry a negative electrical charge.

In nature, different atoms of the same element, that is, atoms all having the same number of protons (and an equal number of electrons), may have differing numbers of neutrons. These atoms which differ from each other only in number of neutrons are the various isotopes of the element. Although different isotopes of any element will have identical chemical properties, they will differ in physical behavior. Some natural isotopes are unstable and achieve stability by decay, that is, by the emission of various particles or rays of energy. Such isotopes, as well as artificially produced isotopes which decay in exactly the same way, are called radioactive.

Radioactive isotopes may be synthetically created in an atomic pile. In an atomic pile, uranium is bombarded with neutrons. When a neutron is absorbed by an atom of uranium, the atom usually splits into two unequal parts and releases neutrons.[27] The various elements formed by those parts[28] are radioactive.

---

[27] This process of fission is accompanied by release of large amounts of energy.

[28] These are the fission products referred to by Borst, *supra*, p. 14.

The neutrons which are released create a chain reaction when they are absorbed by other atoms of uranium which then split. The chain reaction, which if uninhibited is an atomic explosion, is controlled by insertion into the pile of rods of a control material which absorbs neutrons.

Neutrons not used to split other atoms nor absorbed by the control material, can be used to bombard and be absorbed by atoms of other substances which are placed in the pile. Typically, these other substances are naturally non-radioactive isotopes of various elements; by the absorption of a neutron, they become radioactive. In this manner, synthetic radioactive isotopes are created.

Some of the forms of energy, particularly gamma rays, released by radioactive isotopes, are of sufficient strength to penetrate another substance and temporarily remove electrons from, or ionize, that substance. Living organisms can be destroyed by such ionization, and it is that process by which the bacteria in food can be destroyed.

Ionizing radiation can similarly destroy human organisms. Thus the major medical problem in the preservation of food by exposure to ionizing radiation is to devise a process whereby the food, or more specifically the bacteria in the food, can be exposed to ionizing radiation without making the food itself radioactive. 29/ For if the food is radioactive, it will emit

---

29/ If the strength of the ionizing radiation is uncontrolled, it can induce radioactivity in its target, but this problem is, unlike those created by petitioner's methods, easily controlled. See the Federal Food, Drug and Cosmetic Act, 21 U.S.C. 301, 342(a)(2) and (7), and the regulations thereunder, 21 C.F.R. 121.3001 et seq.

radiation which, after consumption of the food, could have a harmful ionizing effect on the human organism.

The two methods proposed by petitioner, exposure of food to an atomic pile and admixture of food with radioactive isotopes, do not avoid this problem. Rather, they result directly in exposing the human organism to the threat of radioactivity.

If, as proposed by petitioner, food to be treated is exposed to an atomic pile, it can be sterilized and preserved by the ionizing radiation emitted by the radioactive fission products. It will also, however, be a target for the neutrons emitted in the chain reaction (see Tr. 74). If the food absorbs any of those neutrons, it can itself become radioactive (see Tr. 89). Thus, in addition to the desired effect, the subjection of the food to radiation, an undesirable effect will be attained and the food will emit radiation. It cannot then be safely ingested.

Similarly, if, as in the other method proposed by petitioner, radioactive isotopes are mixed with the food, the food will be **subjected**, as is desired, to ionizing radiation from the isotopes. By this method, however, although the food itself will not be made radioactive, the admixed harmful radioactive isotopes prevent safe ingestion (see Tr. 75, 112, 115).

It is thus readily understood why neither of the methods of food irradiation proposed by petitioner has been used by the Commission, for neither method can be safely used. Fundamental scientific principles plainly illustrate the deadly dangers inherent in consuming food treated by either of those methods.

In addition to those dangers, the Board pointed to still another source of danger from the use of petitioner's disclosure. As we have noted, the only novelty in that disclosure was the reference to a precise level of radiation to be used. The Board found, however, on the uncontradicted expert testimony introduced at the hearing (Tr. 80-84, 100, 102-03), that the level disclosed not only was far too low to be effective in preserving food but also could be harmful in that it could produce mutant bacteria resistant to radiation (Op. 4, Finding No. 15; Op. 14).

---

In sum, the Board was completely justified in denying an award to petitioner, for the disclosures in his patent application were not new, have not been used, and are not useful. Simply put, petitioner proposed only a bare idea which added nothing to the ideas and knowledge long extant in the field of preservation of food by exposure to ionizing radiation. The particular methods petitioner envisioned, but never reduced to practice, for effectuating his idea have never been used because the dangers inherent in them render them useless. The present successful development of the field is attributable to the basic concepts envisioned by those who preceded petitioner and to long years of experimentation and applied development work of those who followed him.

## CONCLUSION

For the reasons stated, the order of the Patent Compensation Board of the Atomic Energy Commission should be affirmed.

Respectfully submitted,

EDWIN L. WEISL, Jr.,
Assistant Attorney General,

JOHN C. ELDRIDGE,
MICHAEL C. FARRAR,
Attorneys,
Department of Justice,
Washington, D. C. 20530.

MAY 1968.

# APPENDIX

# Radioactive Products

Matter of this invention is a method and its practical applications to provide food, liquids, medical, pharmaceutical or industrial products with an amount of radioactivity, strong enough to have healing consequences and not to strong to dammage the human body, who uses it.

The springs of Joachimstal in Bohemia are known for their healing effect. These springs pass through radioactive soil, created by large layers of Pitchblend of high Uranium content. People make pilgrimages to this area.

It is the purpose of this invention to create artificially the effect of these springs and yet limit radioactivity to a safe degree. Water, milk, beverages, beer, alcohol products, industrial oils and many others can be kept bacteriafree, lifes can be protected, prolongated.

To obtain the limited amount of radioactivity the choosen liquid, plastic or stiff body can be exposed to the atomic pile, a rather complicated and expensive process or it can be processed under use of gazeous or crystallized or other isotopes of limited radioactivity.

This shall be explained on an exemple. In order to obtain a radioactive beverage with limited healing effect, the flavoured concentrate can be made under use of isotopic citric acid. To the solution, which the bottler uses to dilute the concentrate, gazeous isotopes, as those from carbon or any others, as well as crystallized, radioactive sugar or others can be added. According to the invention 1 Gallon of the beverage bottled and ready for the consumer, will contain maximally 100 Milli Roentgen Radioactivity (alpha-, beta-and gamma rays). This under the supposition, that no person will consumate more than one Gallon of this beverage in 24 hours, an amount considered satisfactorily limited.

With other words and more generally: The amount of radioactivity distributed by the maximal volume, used or consumated by a person within twentyfour hours shall not be more than hundred Milli Roentgen. This volume will change with the type of the product. There are relatively little quantities used from tooth paste and only for a short while. Industrial oil kept free from fungi or germs by use of isotopic concentrates will mostly be used within 8 hours and this not continuously. It is useful in many cases to gradually increase radioactivity during the processing of beverages, beers, of plastics and many others.

To return to the example: If to the flavoured concentrate of 1 Gallon of the beverage 200mr citric acid, transported in load boxes, is added in a quantity of 1/10th Gallon, the concentrate would have an average radioactivity of 20mr. If the bottler produces 20 Gallon of beverage with the said concentrate and adds to it 5% sugar of 200mr, the beverage would obtain an average radioactivity of 10 plus 1, that is 11mr, surely of some healing effect and not dangerous.

Radioactive water alone, enriched by minerals as magnesium, carbonates, salts or others, can be a valuable source of health. Dairy products, sweets, beer and many others can be improved, industrial products made more stable and efficient, as industrial oils, soap, washing and cleaning powders or liquids.

Continuous use of such products can have preventive effects in cases of thyrroid gland hypertrophy tendencies and many others. It is like creating a universal antitoxine in the blood.

The invention thus combines healing possibilities with the necessary safeguards and represents a little step ahead on the wide path, open for the use of atomic energy.

Also heat and pressure or a vacuum can be used to increase receptability for radioactive substances.

Claims:

1.) A method to obtain germ-preventing effect in food, liquids, plastics, medical-, pharmaceutical-or other products for human use, as well as in industrial liquids or products, characterized by a hundred Milli Roentgen radioactivity-limit, which might be transmitted to the using person within twentyfour hours.

2.) A method to obtain germ-preventing effect in food, liquids, plastics, medical-.pharmaceutical-or other products for human use, as well as in industrial liquids or products, characterized by a100mr radioactivity-limit, which might be transmitted to the using person within 24 hours, this radioactivity obtained by the gradual incorporation of gazeous, liquid, crystallized or other isotopes into the product during its processing period.

3.) Radioactive food, liquids, sweets, plastics or others for human or for industrial use, provided with a radioactivity of not more than 100mr for the maximal volume consumed or used within 24 hours.

4.) Radioactive food, liquids, sweets, plastics or others for human or for industrial use, provided with a radioactivity of not more than 100mr for the maximal volume consumed or used within 24 hours, the said radioactivity obtained by the gradual incorporation of isotopic substances, gazeous, liquid, plastic or stiff, into the product during its processing stage, whereby also heat and pressure can be used.

5.) Radioactive food, liquids, sweets, plastics or others for human or for industrial use, provided with a radioactivity of not more than 100mr for the maximal volume consumed or used within 24 hours, the said radioactivity obtained by the gradual incorporation of isotopic substances, gazeous, liquid, plastic or stiff, into the product during its processing stage, whereby also heat and pressure can be used, and limited for liquids for human consumation to 100mr per 1 Gallon of the sold, bottled product.

Claims continued:

6. Method to produce radioactive food, liquids, sweets, medical, pharmaceutical or any industrial product, characterized by the limitation of the degree of radioactivity, the consumption or use is allowed to the person, utilizing the product, whereby isotopic sugar, acids, salts or any other compounds are gradually

entered into the production process of the product in question, so that the total radioactivity maximally absorbed by the user is not more than hundred Milliroentgen in 24 hours.

7. A method to obtain stimulating and germ preventing effect in food, liquids, medical, pharmaceutical, hygienical and in any industrial product for use by humans, characterized by the gradual incorporation, also under use of heat and pressure, of isotopic substances of any kind, par exemple sugar, acids or any other chemical, into the product during its processing stage, creating first a concentrate of higher radioactivity and then distributing it into a larger volume, prepared for sale to the consumer, whereby the radioactivity, maximally absorbed by him during twentyfour hours is limited to one hundred Milli roentgen, in order to exclude toxic or dammaging effects to the human body.